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Application data

Applicant(s)
Martinez, Eder

Responsible applicant (abroad)

Addressing Organizational and Technical Barriers in Low-Code Adoption for Advancing Digitalization in the Construction Industry
Practice-to-Science

Detailed evaluation
Comments & declaration concerning conflicts of interests

Further comments

The topic of the proposed project

is within my area of specialisation

Declaration concerning conflict of interests (Comments, if applicable)

Scientific relevance, originality, topicality and independence of the project

Specific strengths

- The project addresses the contemporary need for digitalization emphasizing the role of low-code technology.
- The applicant has the knowledge and expertise to run a project exploiting low-code technologies in the construction industry

Specific weaknesses

- The proposal lacks specificity in addressing the identified gaps and challenges in introducing low-code technology in the construction industry.
- Providing concrete examples, detailing limitations, and clarifying the practical implications would strengthen the proposal and enhance its credibility.

Comments

While the proposal presents a compelling argument for the potential benefits of low-code in improving productivity and sustainability, there are several points of concern and lack of clarity:

- Integration with Building Information Modelling (BIM): The proposal introduces the integration of low-code technology with BIM without clearly establishing why BIM is of interest in this context. The practical implications and specific challenges within the construction sector that necessitate the introduction of low-code technologies are not sufficiently addressed.

- Identified Limitations and Gaps: The abstract mentions the identification of critical limitations and research gaps, but fails to specify what these limitations are. Understanding these limitations is crucial for evaluating the feasibility and effectiveness of introducing low-code in the construction domain.

- Competencies of "Citizen Developers": The term "citizen developer" is introduced without a clear explanation of what it means within the complex and critical domain of construction. The essential competencies required for these developers are mentioned, but a detailed explanation is lacking.

- Practical Implications: The statement, "low-code, particularly in project-based industries like construction," lacks clear practical implications. It would be beneficial to elaborate on why low-code is particularly relevant in project-based industries and how it addresses specific challenges in construction.

- Lack of Examples and Specifics: The abstract contains several statements that are vague and lack concrete examples. For instance, the statement, "low-code interoperability with BIM is the critical first step to streamline BIM processes," needs clarification on what is meant by interoperability and how it contributes to streamlining processes.

- Unclear Gaps and Emerging Nature of Low-Code: The proposal mentions gaps in existing research without specifying what these gaps are. Additionally, the statement, "the results of this inquiry were not conclusive, as we discovered the emerging nature of low-code technology," requires clarification on the nature of the emerging aspects and their impact on the research.

- Justification for Low-Code in Construction: There is a lack of a clear justification for introducing low-code platforms in the construction domain. Understanding the criticalities of existing systems that low-code aims to replace, and how it accommodates the expertise required in construction, is essential.

Rating

	9	Strong in all relevant aspects. No or negligible weaknesses.
	8	
x	7	Strong in most relevant aspects. Few clearly identified weaknesses.
	6	
	5	Strong in several relevant aspects. Some clearly identified weaknesses.
	4	
	3	Some strengths in relevant aspects. Several clearly identified weaknesses.
	2	
	1	Few or no strengths in relevant aspects. Many serious weaknesses.

Approach and methodology

Specific strengths

- The combination of case study and action research provides a robust methodology for understanding the practical implications of low-code in the construction industry.
- Incorporating literature review and semi-structured interviews with industry professionals demonstrates a comprehensive approach to contextualizing and analyzing low-code in real-life scenarios.

Specific weaknesses

- Technical Solution: The proposal mentions developing a technical solution but does not specify whether it is a study, a software platform, a framework, or a set of reusable components. The goals of this technical solution need to be clearly articulated.

Comments

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Feasibility

Specific strengths

- Recognizing the relevance of low-code in project-based industries, such as construction, indicates an understanding of practical implications
- The applicant has the knowledge and expertise to make use of low-code technologies and interact with stakeholders in the construction industry

Specific weaknesses

The vagueness in certain aspects of the research plan, such as the exact nature of low-code integration with BIM and the specific outcomes of the technical solution, poses a challenge in assessing the project's feasibility. Clearer articulation of these aspects is essential for ensuring a well-defined and achievable research trajectory.

Comments

Rating

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Career development (education, acquired expertise and independence of scientific achievements to date), Statement of mobility and career plan

Specific strengths

The applicant's career development illustrates a seamless transition from practical roles on construction sites to influential positions at global firms like Hilti and Implenia. This diverse journey demonstrates adaptability and an international perspective, which are essential for an academic career. The commitment to research is evident through tangible outcomes, including the development of digital solutions and contributions to a certified division-wide training program.

The acquired competencies align well with the proposed project, showcasing a strong foundation in construction engineering and information technology. The practical experiences contribute to a nuanced understanding of industry processes. The PhD research on low-code technology in the construction industry demonstrates the applicant's ability to tackle complex research questions.

Independence in scientific achievements is evident, particularly in initiating low-code technology exploration at Implenia. The publication record, including peer-reviewed journal articles and conference contributions, reflects a developing independence in shaping and disseminating research findings.

The applicant's career progression illustrates a capacity to lead original research. The successful positioning of the first peer-reviewed article in the Q1 Automation in Construction journal indicates the potential for groundbreaking contributions. Integrating innovative solutions in practical settings showcases leadership in driving impactful research outcomes.

Specific weaknesses

The transition from practical roles to academia may pose challenges in fully aligning research objectives with the academic standards of a Practice-to-Science funding scheme.

Comments

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Scientific achievements to date (publications, monographs, etc.)

Specific strengths

The applicant demonstrates a solid track record of publications in the field of construction industry digitalization, showcasing expertise in related topics. Notably, the co-authored papers reveal a consistent engagement with various aspects of construction and technology integration. The papers cover a range of subjects, including the benefits and limitations of low-code development, the application of artificial intelligence in the construction industry, challenges and opportunities in project delivery and information technology integration, and the exploration of lean principles for affordable housing. The depth and diversity of these publications suggest a commendable level of scientific engagement and expertise in the applicant's chosen field.

Specific weaknesses

While the applicant has a significant foundation in the topic area, there is a noticeable gap in clearly defining novel scientific objectives that go beyond the scope of their previous research. The project proposal lacks explicit innovation or a novel research agenda, and it appears to build upon existing work without clearly articulating how the proposed project will significantly advance the current state of knowledge. There is a need for the applicant to demonstrate a more mature understanding of the field by outlining specific and innovative research goals that extend beyond the boundaries of their previous contributions.

Comments

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Practical experience and achievements

Specific strengths

- Diverse experience, transitioning from construction sites to academic pursuits and global firms.
- Bridging practical experience and academic insights from PhD studies at UC Berkeley.
- Development of digital solutions and automated workflows to support various operations.
- Market introduction of products addressing construction industry challenges.
- In-depth understanding of construction operations gained through diverse roles.

Specific weaknesses

- Details on the digital solutions, automated workflows, and technology implementation on-site are briefly mentioned without quantifiable impact metrics for the introduced products in improving productivity

Comments

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Potential for a scientific career and career plan

Specific strengths

- The candidate's trajectory from hands-on construction site roles to academic pursuits, coupled with a successful PhD completion demonstrates a commitment to advancing knowledge in the field
- The clear delineation of career steps, including the strategic move to join leading global firms such as Hilti and Implenia, showcases a deliberate effort to bridge practical insights with academic rigor
- Initiating low-code technology exploration for digitalization in the construction industry during the tenure at Implenia exemplifies an ongoing commitment to research and innovation.
- The applicant's diversified experience across different cultures, environments, and roles positions him favourably for a scientific career, indicating adaptability and a global perspective
- The tangible outcomes, such as the development of digital solutions and participation in a certified division-wide training program, showcase the ability to integrate practical insights into systematic approaches for operational improvement.

Specific weaknesses

- A more explicit link between the proposed project and the broader landscape of the applicant's envisioned scientific contributions could enhance the coherence of the career plan.
- A more detailed discussion of potential challenges and mitigation strategies in transitioning from a practical to a predominantly research-oriented role would provide a more comprehensive assessment of the applicant's readiness for a scientific career within the Practice-to-Science framework.

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Overall Assessment

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Scientific relevance, originality, topicality and independence of the project							x		
Approach and methodology							x		
Feasibility								x	
Career development (education, acquired expertise and independence of scientific achievements to date), Statement of mobility and career plan									x
Scientific achievements to date (publications, monographs, etc.)							x		
Practical experience and achievements								x	
Potential for a scientific career and career plan								x	

Rating								x	

Comment

My primary concerns regarding the project revolve around the limited clarity concerning the scientific and technological objectives, especially in relation to the applicant's already achieved results. While the applicant's track record is commendable and indicates the potential to lead a project focused on the digital transformation of the construction domain, the proposal lacks effectiveness in clearly articulating the specific technical objectives the applicant aims to accomplish. Clarity in defining the strengths and limitations of such objectives is crucial for a comprehensive understanding of the project's scope and potential impact.